

REMARKS

I. Introduction

This paper is submitted in response to the Office Action mailed November 4, 2004 for the above-identified patent application. A one-month extension to the time for responding to the Official Action is respectfully requested and the appropriate fee is enclosed. Claims 1-15 are pending in the application and have all been rejected. Claims 1, 4, 7, 9, 10, 11, 14 and 15 have been amended. Claims 3, 8 and 13 have been canceled. No new matter has been added.

II. The Rejections Under 35 U.S.C. §102(a) Should Be Withdrawn

Claims 1, 5 and 6 have been rejected under 35 U.S.C. § 102(a) as being unpatentable in view of U.S. Patent 6,686,061 to Jeong *et al.* ("Jeong *et al.*"). It is alleged that Jeong *et al.* discloses specific examples of steel welded pipes having compositions which meet the recited claims and has a microstructure of ferrite and pearlite wherein the ferrite has a grain size (FGS) ranging from 22 to 35 microns.

To render a claim anticipated under 35 U.S.C. § 102, a single prior art reference must disclose *each and every element* of the claim in *exactly* the same way. As presently amended, independent claim 1 recites a steel pipe composed of ferrite and at least one of pearlite and cementite, wherein an average size of grains of the ferrite in the microstructure is at least 25 μm and an average size of grains of one of the pearlite and the cementite is 4 to 20 μm .

In contrast, Jeong *et al.* relates to a steel product having a microstructure consisting essentially of ferrite and pearlite having a grain size of 20 μm or less. (See Jeong *et al.*, Abstract). Furthermore, Jeong *et al.* does not disclose the ferrite in the microstructure is at

least 25 μm and an average size of grains of one of the pearlite and the cementite is 4 to 20 μm ,
as recited in the present claimed invention. Accordingly, Jeong *et al.* does not disclose each and every element of amended independent claim 1. As claims 5 and 6 depend from independent claim 1, which is believed allowable for at least the reasons discussed above, these dependent claims are also allowable.

Therefore, reconsideration and withdrawal of the rejection of Claims 1, 5 and 6 under 35 U.S.C. § 102(a) as being unpatentable in view of Jeong *et al.* is respectfully requested.

III. The Rejections Under 35 U.S.C. §103 Should Be Withdrawn

(A) U.S. Patent 6,686,061 to Jeong *et al.* (“Jeong *et al.*”)

Claims 1-6 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of U.S. Patent 6,686,061 to Jeong *et al.* (“Jeong *et al.*”). It is alleged that it would have been obvious to select the ranges claimed in the present invention from the disclosure of Jeong *et al.* because the prior art has the same utility to make a welded steel pipe. Moreover, it is alleged that the prior art’s disclosure of a pearlite microstructure having a grain size of 20 microns or less overlaps applicant’s ferrite range of at least 20 microns.

To establish obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). As stated above, Jeong *et al.* does not teach or suggest a steel plate having a ferrite with a grain size of 25 μm or more and a pearlite or cementite with a grain size of 4 to 20 μm , as recited in amended independent claim 1. Furthermore, the present invention is directed to a steel pipe having a low yield ratio. During production a pipe will undergo cold-working, such as bending, pipe

expansion, drawing, etc., which may result in a higher yield ratio than that of the steel sheet used as the mother material. (See specification paragraph 5; Tables 1 - 6). Thus, the present invention is directed to a steel pipe in which the increase in yield ratio, caused by applied strains due to cold working, is minimized using a specific chemical composition and average grain size of the ferrite, pearlite and/or cementite microstructure.

Jeong *et al.* does not disclose or suggest a steel pipe with the specific chemical composition and microstructure as disclosed in the present invention and therefore results in a higher yield ratio than that disclosed in the present invention. (See Jeong *et al.* Table 2). Furthermore, Jeong *et al.* does not even contemplate the increase in yield ratio caused by cold working a steel sheet to form a steel pipe having a low yield ratio. Accordingly, it would not have been obvious to select the ranges claimed in the present invention to produce a steel pipe having a low yield ratio, as recited in amended claim 1. Therefore, it is respectfully submitted that the Examiner has failed to set forth a *prima facie* case of obviousness with respect to independent claim 1. As claims 2 and 4-6 depend from independent claim 1, which is believed allowable for at least the reasons discussed above, these dependent claims are also allowable.

In view of the foregoing, reconsideration and withdrawal of the rejection of claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable in view of Jeong *et al.* is respectfully requested.

(B) Japanese Patent 11-256268 (“JP ‘268”)

Claims 1-3, 5 and 6 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Japanese Patent 11-256268 (“JP ‘268”). It is alleged that JP ‘268 discloses specific steel alloy examples with a microstructure of ferrite having a grain size of at

least 20 μm and cementite having a grain size of 0.4 to 1 μm . (See JP '268, Table 1, examples A and B).

As presently amended, independent claim 1 recites a steel pipe composed of ferrite and at least one of pearlite and cementite, wherein an average size of grains of the ferrite in the microstructure is at least 25 μm and an average size of grains of one of the pearlite and the cementite is 4 to 20 μm . Therefore, JP '268 does not teach or suggest all the claim limitations recited in the presently claimed invention.

Furthermore, the present invention is directed to a steel pipe with a specific chemical composition and microstructure, resulting from the average grain size of ferrite, pearlite and/or cementite, in which the increase in yield ratio, caused by applied strains due to cold working, is minimized. JP '268 does not disclose or suggest the increase in yield ratio caused by cold working a steel sheet to form a steel pipe having a low yield ratio. Accordingly, it would not have been obvious to select the ranges claimed in the present invention to produce a steel pipe having a low yield ratio, as recited in amended claim 1. Therefore, it is respectfully submitted that the Examiner has failed to set forth a *prima facie* case of obviousness with respect to independent claim 1. As claims 2, 5 and 6 depend from independent claim 1, which is believed allowable for at least the reasons discussed above, these dependent claims are also allowable.

In view of the foregoing, reconsideration and withdrawal of the rejection of claims 1-3, 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable in view of JP '268 is respectfully requested.

(C) U.S. Patent 5,948,183 to Okada *et al.* (“Okada *et al.*”)

Claims 7-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of U.S. Patent 5,948,183 to Okada *et al.* (“Okada *et al.*”). It is alleged that Okada *et al.* teaches a ferritic/bainitic steel pipe having a composition as recited in claims 7-10. The Examiner further states that Okada *et al.* does not teach an average ferrite grain size of at least 20 microns or a bainite content of 1-15% by volume.

As amended, independent claim 7 recites a steel pipe wherein the average size of grains of the ferrite in the microstructure is at least 20 μm and wherein the bainite has a content rate, based on a volume fraction, is in the range from 1% to 15%. As stated by the Examiner, Okada *et al.* does not teach an average ferrite grain size of at least 20 microns or a bainite content of 1-15% by volume. In addition, Okada *et al.* does not teach or suggest a content by mass of carbon of 0.05% to 0.20%, as recited in independent claim 7. Accordingly, all the claim limitations are not taught or suggested by Okada *et al.*

It is alleged that the ferrite grain size and content of bainite, as disclosed in the present invention, would be expected if the chemical composition are met and tensile strength and yield ratio are closely equivalent. However, as described above, Okada *et al.* does not teach or suggest the chemical composition of amended independent claim 7 and therefore results in a higher yield ratio than that disclosed in the present invention. Moreover, using a specific chemical composition and microstructure to minimize the yield ratio, caused by cold working a steel pipe, is not taught or suggested by Okada *et al.* Therefore, it is respectfully submitted that the Examiner has failed to set forth a *prima facie* case of obviousness with respect to

independent claim 7. As claims 9 and 10 depend from independent claim 7, which is believed allowable for at least the reasons discussed above, these dependent claims are also allowable.

In view of the foregoing, reconsideration and withdrawal of the rejection of claims 7-10 under 35 U.S.C. § 103(a) as being unpatentable in view of Okada *et al.* is respectfully requested.

(D) Japanese Patent 9-165644 (JP '644)

Claims 7-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Japanese Patent 9-165644 (JP '644). It is alleged that JP '644 teaches a ferritic/bainitic steel pipe having a composition as recited in claims 7-10. The Examiner further states that JP '644 does not teach an average ferrite grain size of at least 20 microns or a bainite content of 1-15% by volume.

As amended, independent claim 7 recites a steel pipe with an average size of grains of the ferrite in the microstructure is at least 20 μm and wherein the bainite has a content rate which is, based on a volume fraction, in the range from 1% to 15%. As stated by the Examiner, Okada *et al.* does not teach an average ferrite grain size of at least 20 microns or a bainite content of 1-15% by volume. In addition, JP '644 does not disclose or suggest a steel pipe containing 0.0001%-0.005% boron, as recited in amended independent claim 7. Accordingly, all the claim limitations are not taught or suggested by JP '644.

It is alleged that the ferrite grain size and content of bainite, as disclosed in the present invention, would be expected if the chemical composition are met and tensile strength and yield ratio are closely equivalent. However, as described above, JP '644 does not teach or

suggest the chemical composition of amended independent claim 7 and therefore results in a higher yield ratio than that disclosed in the present invention. Moreover, using a specific chemical composition and microstructure to minimize the yield ratio, caused by cold working a steel pipe, is not taught or suggested by JP '644. Therefore, it is respectfully submitted that the Examiner has failed to set forth a *prima facie* case of obviousness with respect to independent claim 7. As claims 9 and 10 depend from independent claim 7, which is believed allowable for at least the reasons discussed above, these dependent claims are also allowable.

Therefore, in view of the foregoing, reconsideration and withdrawal of the rejection of claims 7-10 under 35 U.S.C. § 103(a) as being unpatentable in view of Okada *et al.* is respectfully requested.

(E) Japanese Patent 10-265844 ("JP '844") further in view of JP '644

Claims 7-15 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Japanese Patent 10-265844 ("JP '844") further in view of JP '644. It is alleged that JP '844 discloses specific examples that meet the claimed composition except does not include nitrogen as an alloying constituent. It is further alleged that JP '644 discloses that small amounts of nitrogen would be desirable to enhance the strength of the steel. It is stated that although the prior art does not teach the bainite or martensite at 1 to 15% by volume, it would be expected since the composition, microstructure, and properties are closely met.

As amended, independent claims 7 and 11 recite a steel pipe with an average size of grains of the ferrite in the microstructure is at least 20 μm and wherein the bainite has a content rate which is, based on a volume fraction, in the range from 1% to 15%. As stated by the Examiner, JP '844 does not teach an average ferrite grain size of at least 20 microns or a bainite

content of 1-15% by volume. In addition, JP '844 does not teach or suggest a steel pipe containing 0.0001%-0.005% boron, as recited in amended independent claim 7. Therefore, all the claim limitations are not taught or suggested by JP '844.

Furthermore, minimizing the yield ratio caused by cold working a steel sheet to form a steel pipe having a low yield ratio is not taught or suggested by JP '844. Therefore, it is respectfully submitted that the Examiner has failed to set forth a *prima facie* case of obviousness with respect to independent claims 7 and 11. In addition, as stated above, JP '644 also does teach or suggest the bainite has a content rate which is, based on a volume fraction, in the range from 1% to 15%. Furthermore, JP '644 also does not disclose or suggest a steel pipe containing 0.0001%-0.005% boron. Therefore, the addition of JP '644 does not set forth a *prima facie* case of obviousness with respect to independent claims 7 and 11. As claims 9, 10, 12, 14 and 15 depend from independent claims 7 and 11, which are believed allowable for at least the reasons discussed above, these dependent claims are also allowable.

Therefore, in view of the foregoing, reconsideration and withdrawal of the rejection of claims 17-15 under 35 U.S.C. § 103(a) as being unpatentable in view of JP '844 further in view of JP '644 is respectfully requested.

IV. **Conclusion**

In view of the foregoing remarks, reconsideration and allowance of now pending claims 1, 2, 4-7, 9-12, 14 and 15 are respectfully requested.

A one-month extension to the time for responding to the Official Action is respectfully requested and the appropriate fee is enclosed. Applicants believe that no additional fees are due. However, in the event that fees are due, the Commissioner is hereby authorized to charge payment of any such fees to Deposit Account No. 02-4377.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Gary M. Butter', is written over a horizontal line.

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